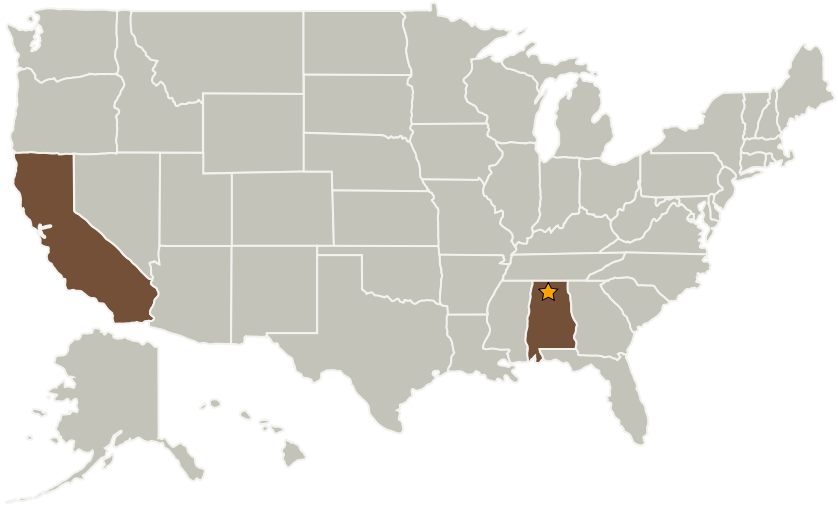
Adaptive Lobster-Eye Hard X-Ray Telescope, Phase I

Completed Technology Project (2007 - 2007)

Project Introduction

To address NASA needs for hard X-ray telescopes for starlight detection and wavefront analysis, Physical Optics Corporation (POC) proposes to develop an Adjustable Lobster-Eye X-ray telescope (ALEX) based on POC's Lobster-Eye optics. This approach incorporates two important innovations: (1) new ALEX design--an adjustable array of smaller Lobster-Eye lenses for improved sensitivity, and (2) lens fabrication from two sets of iridium-coated semiconductor-grade silicon plates via POC-patented technology, satisfying the requirement for high flatness compatible with operating wavelengths. These innovations reduce weight 2-3 times compared to conventional Wolter I telescopes, increase angular resolution (8 arcseconds) and versatility, and reduce cost. In high-sensitivity mode, ALEX will have an effective collecting area of >1600 sq. cm. in the 0.25 40 keV range, and operate up to at least 80 keV; in wide-angle mode, ALEX will span a field of view >1.8 deg. In Phase I POC will demonstrate the feasibility of ALEX technology by building/testing a prototype single Lobster-Eye lens, reducing Phase II development risk. In Phase II POC will develop a fully functional prototype lens array and demonstrate its performance as a hard X-ray telescope. These results will allow NASA to build lightweight, high-performance hard X-ray telescopes.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Marshall Space Flight Center (MSFC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Marshall Space Flight Center(MSFC)	Lead Organization	NASA Center	Huntsville, Alabama
Physical Optics Corporation	Supporting Organization	Industry	Torrance, California

Primary U.S. Work Locations	
Alabama	California

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.1 Remote Sensing Instruments/Sensors
    - TX08.1.1 Detectors and Focal Planes